The interface at the OLEC is a 4-wire interface, described as a DS0A interface in Bellcore TA-TSY-000077, Di gital Channel Banks- Requirements for Dataport Channel Unit Functions.

Basic Rate Access ISDN may be provided via metallic facilities, DLC, or both. The insertin loss of the metallic facility, measured at 40 kHz, shall be less than 42 db. No dc specifications are supported.

The interface at both the OLEC and the Network Interface is a 2W intrface as defined in ANSI T1.601, ISDN Basic Access Interface for use on Metallic Loops for Applications on the Network Side of the NT.

Asymmetric Digital Subscriber Line (ADSL) Metallic Interface is a 2W-EE consisting of metallic facilities only. These facilities will be provided with no DLC, load coils or repeaters. Typically, BST will use 26 gauge cable up to 15,500 feet without bridge tap and up to 18,000 feet with bridge tap. The insertion loss, measured between 100 ohms terminations at 200 kHz should be less than 48 db. The dc resistance of a single wire pair should not exceed 1100 ohms.

High-bit rate Digital Subscriber Lines (HDSL) is a transport technology that can be either 2W-EE or 4W-EE. The loop facility consists of only metallic facilites. The insertion loss, measured between 100 ohm terminations at 200 kHz, should be less than 48 dB. The dc resistance of a single pair should not exceed 1100 ohms.

B. Diversity Requirements

No requirements for UNEs but some level of diversity will exist in BST network (embedded and forward looking)

C. Performance Monitoring

No specific requirement, however, network element will be monitored as part of BST network infrastructure.

D. Special Considerations (SIG, SAW, etc.)

- Assume no SIG applies for dedicated UNEs
- Assume no state-specific missed appointment credits (payments - currently FL. only)
- SAW does not apply
- Services outage credit may be the same as PL tariff
- Billing Guarantees do not apply - there will be CABS cost to exclude UNEs from current processes
- Blocking Performance reports - none

IV. OAM&P (ordering, administration, maintenance, and provisioning)

A. Intervals for Installation, Repair, etc.

Installation

- Where facilities are available, BST will install UDLs within a 5-7 business days interval.
- Expedite charges will apply for shorter intervals requested by the OLEC.
- The Service Inquiry process will be utilized for 2W-EE and 4W-EE circuits.

Repair
- TBD

B Description of Centers Affected and Their Role(s)

ICSC (usage billing only)
LCSC - Local Customer Service Center
AFIG - Assignment Facility Inventory Group
OSPE - (loop only)
CPG
CCM - Capacity Mgmt.
NISC
C.O. Operations
Field Work Groups
RRC, BRC, ACAC etc.

C. Ordering Standards and Order Reception Standards

- LCSC will receive and process orders.
- OLEC will utilize mechanized entry system where available.
- The Service Inquiry process will be utilized for 2W-EE and 4W-EE circuits.
- Entry system will accept only error free orders into our ordering systems.
- **If a mechanized order entry system is available and the OLEC sends a manual order, BST will bill the OLEC a charge associated with the additional cost that BST would incur with the manual process.**

If a customer chooses to subscribe to an OLEC for local service and would like to retain their present telephone number, two service orders must be issued. There would be a service order to disconnect their present local service utilizing the re-use FID (RRSO & RUF) if local loop is provided by BellSouth. The second order will be the add of the OLEC service utilizing the re-use FID (RRSO & RUF).

The two FIDs will allow LFACS to hold the disconnect local loop assignment intact for re-use on the OLEC add order.

D. Repair Standards and Repair Order Reception Standards
E. Service Management
F. Billing and Special Arrangements
1) CABS vs CRIS

All UDLs will be billed via CABS

2) Release Requirements
3) Special Considerations
G. Internal Training Requirements

H. Staff Support Requirements
   1) Initial roll-out
   2) On-going requirements

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TSD – NETWORK INTERFACE DEVICES (NID)

I. Market Service Description

A. Basic Service Features

NID Access is designed to allow an OLEC the opportunity to connect its loop to the inside wiring portion of BST's Network Interface Device (NID). It is expected that the OLEC will provision a loop and a NID to the customer's location. In these circumstances, the OLEC may perform a physical cross-connect of the inside wire to its loop. This will then provide a communication pathway from the OLEC, through BST's NID, to the end users inside wire.

In those cases where BST may not have a NID, but instead terminates its loops directly to the inside wire of the end user, or where the existing NID is not suitable for OLEC connection, BST will:

1. Install a NID (at the end of the BST loop) so the OLEC may cross-connect its loop (via its NID) to the BST NIDand,

2. At the OLEC's request, install a second NID for the OLEC and will provide the cross-connect from the BST NID to the OLEC NID (NID/CC).

In these cases, BST will charge the OLEC a non-recurring charge for the installation of the NID, and, if the OLEC orders a NID and cross-connect from BST, BST will charge the OLEC a non-recurring charge for those elements. The OLEC will be required to provide maintenance and repair on the portion of the NID utilized by the OLEC. If these components require any joint maintenance and/or repair, the OLEC will issue an order with the LCSC to schedule a mutually agreeable time to complete the work. If this work is done to rectify a faulty NID or some other work done at BST's request, BST would not charge the OLEC. If, however, the work is required by the OLEC or due to some activity initiated by the OLEC, BST would bill the OLEC on a time and material basis for the required work-time.

BST expects the OLEC to label their loops that terminate in a BST NID. The label should provide the OLEC's name and contact information (e.g., toll-free number, etc.), as well as a circuit identification number.

In those states where the PSC has allowed the OLEC to remove the BST loop from a BST NID where no spare terminal capacity exists (GA, TN), it will be the OLEC's responsibility to ensure that there is no safety hazard, etc., and must hold BST harmless for any liability associated with the OLEC's removal of the BST loop from the BST NID.
BST expects that the OLEC will use the following procedures to re-ground a disconnected BST loop:

If the BellSouth pair is originally terminated on a protector (which provides lightning and high voltage protection) within the NID, the OLEC will re-terminate the BellSouth pair on another protector of equal or better quality which has been grounded as per National Electric Code standards. If the pair is not currently terminated on a protector (that is the protection is provided at another location within or on the building) the pairs should be terminated on a new cross connection device (i.e. 66 block) such that the pairs are not subject to electrical faults (shorts, grounds, crosses, etc.) at the point of

connection. If the OLEC does not wish to accept this responsibility, then options 1 and 2 listed above are applicable.

Additionally, (at the OLEC's request) BST will provide maintenance and repair services on its NID and, if applicable, the BST installed OLEC NID and cross-connect (NID-TM).

B. **Basic Service Capabilities**

C. **Forecast**

1) **Regional (interstate and intrastate)**

TBD

2) **State (interstate and intrastate)**
3) **Geo/wire center**

D. **Pricing Structure and Description**

BST does not plan to charge the OLEC any recurring or non-recurring charges for the OLEC's use of this NID. However, if the NID requires any maintenance or repair, BST will charge the OLEC on a time and material basis for the required work-time. Additionally, in those states where BST is required to provide NID's that are unbundled (and priced separately from the BST unbundled loop), then BST will develop recurring and non-recurring rates associated with the NID.

1) **NRC (non-recurring charge)**

It is expected that BST will need three NID offerings:

Network Interface Device (NID)
Network Interface Device Cross-Connect (NID/CC)
Network Interface Device Time and Material (NID-TM)
Network Interface Device Manual Order (NID-MO)

2) **Recurring Charge**

None proposed (except as described above)

3) **Credit Terms (for failure to meet commitments)**

E. **Deployment Schedule**

BST will be required to offer this capability in all end offices. However, it is expected that OLECs will target their service offerings in the Tier 1 and Tier 2 metro areas.

F. **Distribution Channels**

Use Interconnection Services Sales channels -- 12 headcount shared among all UNE's.

Use ASR/LSR Process through LCSC (Local Customer Service Center) -- see Kathy Massey standard process flows templates - ICSC.
Common EDI Interface (under development).

G. Product Codes, Sales Codes Requirements

Unique sales codes for LCSC
Establish new product codes for UNE's

H. Product Tracking Needs

Unit Counter
- Per MOU for usage-based
- Per unit for non-usage based

Revenue and Expenses - ABIS
Accounted for by: Region/State/GEO/Wire Center/Customer (by ACNA)

I. Tariff, Contract, or Other Agreement

BST will negotiate in good faith with all requesting OLECs to determine the terms, conditions and pricing associated with this offering. It is expected that BST will offer this service via a contract arrangement until the market and regulatory dynamics are appropriate for a tariff filing.

Need one headcount for contract administration spread over all UNE's.

J. Advertising and Promotion Plans and Requirements

Development of common "fact sheet" type brochure $50k per year through 1999 spread to all UNEs.
InterNet WEB page -- $100k per year through 1999 spread to all UNEs.

K. Customer Training Considerations

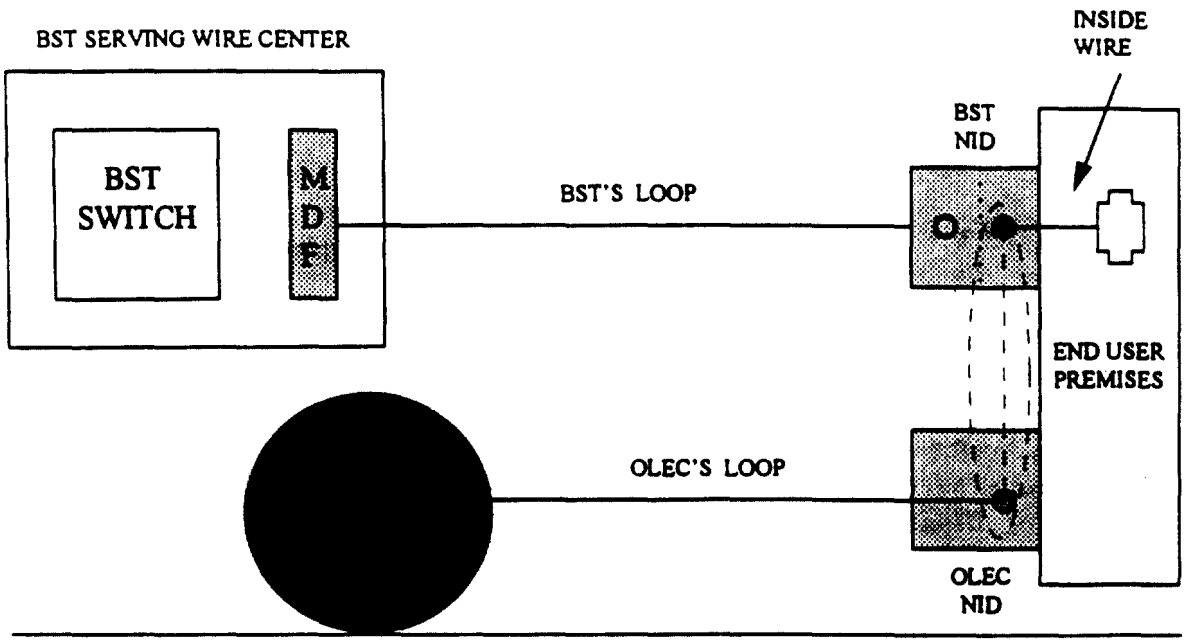
Customer Training: one person-year plus $20k materials per year through 1999
- Document-based training (not face to face)
- How to order
- Tech requirements/interface specifications
- Maintenance/repair
- General product overview - all UNE's
- Assume: man-hour loading - travel, PC equipped (misc.: office space, supplies)

L. Staff Support Requirements

II. Network Architecture

A. Physical Network Configuration

1) switching requirements
2) signaling
3) recording (AMA, etc.)
4) transport
5) Drawing of Network Elements



B. OSS (operational support systems) Requirements

C. Software Requirements (AIN, queries, etc.)

III. Performance Standards and Reliability

A. General Description of Performance Standards and Reliability (parity, etc.)

Need to develop BellSouth Technical Reference for UNEs. 100 person days +$7500 (all UNEs)

B. Diversity Requirements

No requirements for UNEs but some level of diversity will exist in BST network (embedded and forward looking)

C. Performance Monitoring

No specific requirement, however, network element will be monitored as part of BST network infrastructure.

D. Special Considerations (SIG, SAW, etc.)

- Assume no SIG applies for dedicated UNEs
- Assume no state-specific missed appointment credits (payments - currently FL. only)
- SAW does not apply
- Services outage credit may be the same as PL tariff
- Billing Guarantees do not apply - there will be CABS cost to exclude UNEs from current processes
- Blocking Performance reports - none

IV. OAM&P (ordering, administration, maintenance, and provisioning)

A. Intervals for Installation, Repair, etc.

Installation
- BST will install a NID and perform any cross-connect ordered by the OLEC within 5 -7 business days.
- Expedite charge for short intervals

Repair
- TBD

B Description of Centers Affected and Their Role(s)

ICSC (usage billing only)
LCSC - Local Customer Service Center
AFIG - Assignment Facility Inventory Group
OSPE - (loop only)
CPG
CCM - Capacity Mgmt.
NISC
C.O. Operations
Field Work Groups
RRC, BRC, ACAC etc.

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- LCSC will receive and process orders.
- OLEC will utilize mechanized entry system where available.
- Entry system will accept only error free orders into our ordering systems.
- **If a mechanized order entry system is available and the OLEC sends a manual order, BST will bill the OLEC a charge associated with the additional cost that BST would incur with the manual process. This charge (NID-MO) will be billed in addition to the normal NRC which assumes a mechanized process.**

D. Repair Standards and Repair Order Reception Standards

E. Service Management

F. Billing and Special Arrangements
   1) CABS vs CRIS

      The NID elements will be billed in CRIS

   2) Release Requirements
   3) Special Considerations
G. Internal Training Requirements

H. Staff Support Requirements
   1) Initial roll-out
   2) On-going requirements

GLOSSARY

TBD

TAB 7

BellSouth Interconnection Services

Technical Service Description

Unbundled Loop Concentration

ULC

Version 32

Jerry Latham
Product Manager
205-977-1070

Thad June
Project Manager
404-529-0583

UNBUNDLED LOOP CONCENTRATION (ULC)
TECHNICAL SERVICE DESCRIPTION

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I. Market Service Description

A. Basic Service Features

ULC will allow an OLEC to concentrate up to 96 UVL/UDLs on to 2, 3 or 4 DS1s for the purpose of transporting the circuits back to the OLEC switch at a concentrated level.

B. Basic Service Capabilities

BST will concentrate loops from a given wire center onto a digital transport facility to an OLEC. The OLEC may combine multiple UVL/UDL loops onto a ULC facility in order to concentrate the loops onto a DS1 facility. The actual method of providing this concentration will depend upon office specific capabilities, the current serving arrangement for each unbundled loop, and the OLEC's requirements.

BST will not concentrate loops from multiple wire centers onto a single DS1 digital transport facility.

C. Forecast

1) Regional (interstate and intrastate)

See Attachment

2) State (interstate and intrastate)
3) Geo/wire center

D. Pricing Structure and Description

ULC will consist of four components. ULC-CF (concentration functionality) will provide the equipment and the features associated with concentrating the loops. ULC-LI (loop interface) provides the connection at the MDF, the line card in the concentrator, and the jumper needed from the MDF to the concentrator. This element would be provided either as two-wire interface (ULC-LI/2W) or a four-wire interface (ULC-LI/4W). ULC-DI (DS1 prime interface) will provide a DS1 prime connection from the loop concentration unit to some type of interoffice transport device (e.g., an OLECs collocation space or BST's interoffice transport multiplexer). The ULC-DI will consist

of the trunk card in the concentrator; the jumper (at DS1 prime) from the concentrator to the Digital Signal Cross-Connect (DSX); the DSX connection; and, the jumper (at DS1 prime) from the DSX to the interoffice transport (OLEC/MUX)..

1) **NRC (non-recurring charge)**

ULC-CF
ULC-LI
- ULC-LI/2W
- ULC-LI/4W

ULC-DI
ULC-MO (manual order)

2) **Recurring Charge**

ULC-CF = Flat-rated per system
ULC-LI
- ULC-LI/2W = Flat-rated per loop terminated on system
- ULC-LI/4W = Flat-rated per loop terminated on system

ULC-DI = Flat-rated per DS1 prime terminated on system

3) **Credit Terms (for failure to meet commitments)**

TBD

E. Deployment Schedule

BST will be required to offer this capability in all end offices. However, it is expected that OLECs will target their service offerings in the Tier 1 and Tier 2 metro areas.

F. Distribution Channels

Use Interconnection Services Sales channels -- 12 headcount shared among all UNE's.
Use ASR/LSR Process through LCSC (Local Customer Service Center) -- see Kathy Massey standard process flows templates - ICSC.
Common EDI Interface (under development).

G. Product Codes, Sales Codes Requirements

Unique sales codes for LCSC
Establish new product codes for UNE's

H. Product Tracking Needs

Unit Counter
- Per MOU for usage-based
- Per unit for non-usage based

Revenue and Expenses - ABIS
Accounted for by: Region/State/GEO/Wire Center/Customer (by ACNA)

I. Tariff, Contract, or Other Agreement

BST will negotiate in good faith with all requesting OLECs to determine the terms, conditions and pricing associated with this offering. It is expected that BST will offer this service via a contract arrangement until the market and regulatory dynamics are appropriate for a tariff filing.

Need one headcount for contract administration spread over all UNE's.

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Development of common "fact sheet" type brochure $50k per year through 1999 spread to all UNEs.
InterNet WEB page -- $100k per year through 1999 spread to all UNEs.

K. Customer Training Considerations

Customer Training: one person-year plus $20k materials per year through 1999
- Document-based training (not face to face)
- How to order
- Tech requirements/interface specifications
- Maintenance/repair
- General product overview - all UNE's
- = Assume: man-hour loading - travel, PC equipped (misc.: office space, supplies)

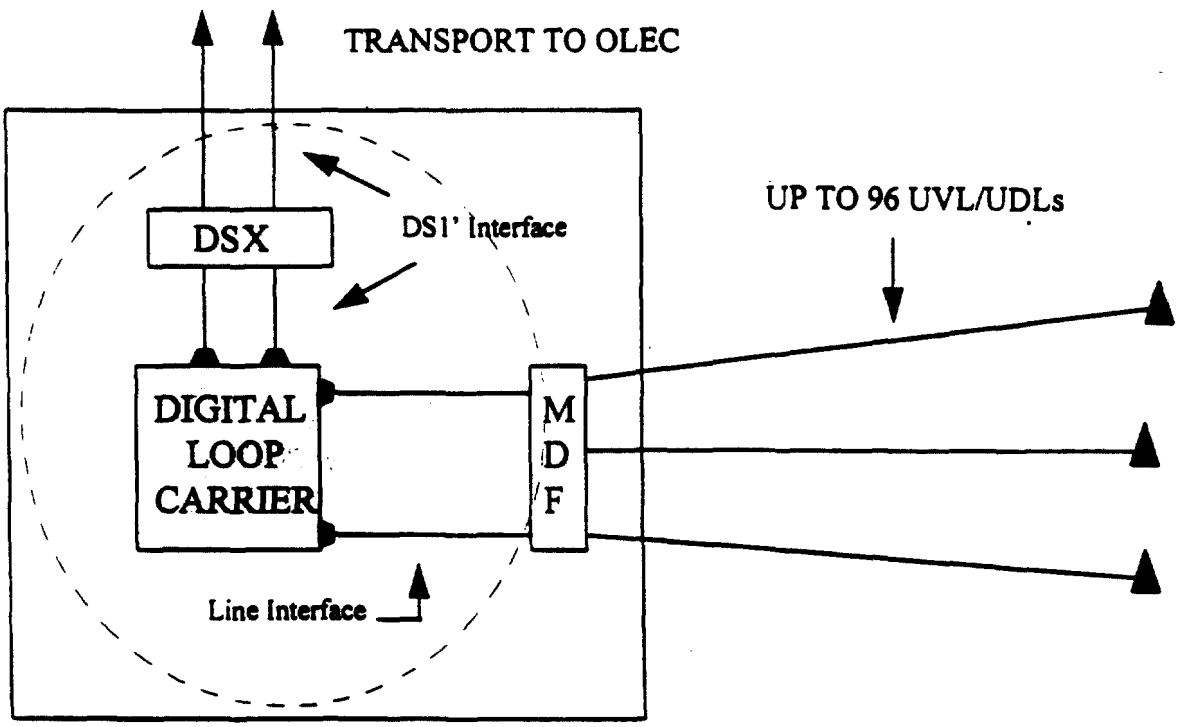
L. Staff Support Requirements

II. Network Architecture

A. Physical Network Configuration

The Channel Bank may be a ~~D4,~~ TR-08, Mode 2 TR-08 ~~or a TR-303 channel bank,~~ or some other multiplexer (chosen by the OLEC from a list of BellSouth standards).

1) **switching requirements**
2) **signaling**
3) **recording (AMA, etc.)**
4) **transport**
5) **Drawing of Network Elements**



BST SERVING WIRE CENTER

B. **OSS (operational support systems) Requirements**

C. **Software Requirements (AIN, queries, etc.)**

III. Performance Standards and Reliability

A. General Description of Performance Standards and Reliability (parity, etc.)

Need to develop BellSouth Technical Reference for UNEs. 100 person days + $7500 (all UNEs).

B. Diversity Requirements

No requirements for UNEs but some level of diversity will exist in BST network (embedded and forward looking)

C. Performance Monitoring

No specific requirement, however, network element will be monitored as part of BST network infrastructure.

D. Special Considerations (SIG, SAW, etc.)

- Assume no SIG applies for dedicated UNEs
- Assume no state-specific missed appointment credits (payments - currently FL. only)
- SAW does not apply
- Services outage credit may be the same as PL tariff
- Billing Guarantees do not apply - there will be CABS cost to exclude UNEs from current processes
- Blocking Performance reports - none

IV. OAM&P (ordering, administration, maintenance, and provisioning)

A. Intervals for Installation, Repair, etc.

Installation
- Need to establish standard for each UNE
- Expedite charge for short intervals

Repair
- TBD

B Description of Centers Affected and Their Role(s)

ICSC (usage billing only)
LCSC - Local Customer Service Center
AFIG - Assignment Facility Inventory Group
OSPE - (loop only)
CPG
CCM - Capacity Mgmt.
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D. Repair Standards and Repair Order Reception Standards
E. Service Management
F. Billing and Special Arrangements
1) CABS vs CRIS

ULC elements will be billed in CABS

2) Release Requirements
3) Special Considerations
G. Internal Training Requirements
H. Staff Support Requirements
1) Initial roll-out

2) On-going requirements

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TRANSMISSION CHARACTERISTICS

NOTICE

This Technical Reference describes Unbundled Local Loops provided by BellSouth Telecommunications (BST), Inc. An Unbundled Local Loop provides a transmission path between a BST central office and an end-user location. This document describes the signals as they appear at the associated interfaces. It also describes some aspects of the performance of the channel.

BST reserves the right to revise this document for any reason, including but not limited to, conformity with standards promulgated by various governmental or regulatory agencies, utilization of advances in the state of the technical arts, or the reflection of changes in the design of any equipment, techniques, or procedures described or referred to herein. Liability to anyone arising out of use or reliance upon any information set forth herein is expressly disclaimed, and no representations or warranties, expressed or implied, are made with respect to the accuracy or utility of any information set forth herein.

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Nothing contained herein shall be construed as conferring by implication, estoppel or otherwise, any license or right under any patent, whether or not the use of any information herein necessarily employs an invention of any existing or later issued patent.

If further information is required, please contact:

Director — Transport Systems Engineering
BellSouth Telecommunications, Inc.
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Birmingham, AL 35243

UNBUNDLED LOCAL LOOP - TECHNICAL SPECIFICATIONS

1. General

1.1 Scope

This document provides the technical specifications for the Unbundled Local Loops offered by BellSouth Telecommunications (BST). Unbundled Local Loops enables an Competitive Local Exchange Carrier (CLEC) to provide services to an end-user location. While Unbundled Local Loops supporting a wide variety of signaling schemes are available, the widespread use of Digital Loop Carrier (DLC) in the BST network requires that a particular signaling scheme be specified when an Unbundled Local Loop is ordered.

1.2 Availability

Unbundled Local Loops are provided subject to availability on a first-come first-served basis.

1.3 Revisions

This is the first version of this document. In future revisions, this section will provide an overview of the changes made with that revision.

2. References

The following documents are referenced:

(1) ANSI T1.401-1993, *Telecommunications — Interface Between Carriers and Customer Installations - Analog Voicegrade Switched Access Lines Using Loop-Start and Ground-Start Signaling*

(2) ANSI T1.405-1996, Telecommunications — Interface Between Carriers and Customer Installation Interfaces, Direct-Inward-Dialing Analog Voicegrade Switched Access Using Loop Reverse-Battery Signaling

(3) ANSI T1.407-1990, *Telecommunications — Interface Between Carriers and Customer Installations — Analog Voicegrade Special Access Lines Using Customer-Installation-Provided Loop-Start Supervision*

(4) ANSI T1.410-1992, *Telecommunications — Carrier-to-Customer Metallic Interface - Digital Data at 64 kbit/s and Subrates*

(5) ANSI T1.413 - 1995, *Telecommunications — Network and Customer Installation Interfaces — Asymmetric Digital Subscriber Line (ADSL) Metallic Interface*

(6) ANSI T1.601-1992, Telecommunications — ISDN Basic Access Interface for use on Metallic Loops for Application on the Network Side of the NT

(7) ANSI/IEEE 455-1985, *Standard Test Procedure for Measuring Longitudinal Balance of Telephone Equipment Operating in the Voice Band*

(8) ANSI/IEEE 743-1995, *Standard Equipment Requirements and Measurement Techniques for Analog Transmission Parameters for Telecommunications*

(9) Committee T1 Technical Report No. 28, A Technical Report on High-Bit-Rate Digital Subscriber Lines

(10) Bellcore TA-TSY-000077, Digital Channel Banks - Requirements for Dataport Channel Unit Functions

(11) Bellcore SR-TSV-002275, BOC Notes on the LEC Networks - 1994

3. Overview

3.1 Loop Topology

Unbundled Local Loops extend from the Main Distributing Frame (MDF) in BST's Central Office (CO) to the End User Interface). They may be composed in either of the following arrangements:

- D entirely of paired metallic conductors, or
- D the concatenation of a universal DLC channel with paired metallic conductors.

3.2 Digital Loop Carrier

The use of DLC brings up the following two considerations.

- D Some technologies, such as High Bit-rate Digital Subscriber Line (HDSL), cannot be transported via DLC due to the bandwidth employed. When a customer is served by DLC, an Unbundled Local Loop providing such a wide bandwidth will not typically be available.
- D Many dedicated voiceband circuits employ signaling that requires unique DLC line cards.

3.3 Inductive Loading

Of the loops employing only metallic facilities, a significant percentage are loaded. Loading involves the placement of inductors, typically every 6000 feet, in the loop. These inductors introduce intolerable attenuation at frequencies above the voiceband, again making wide bandwidth services unavailable.

3.4 Types of Unbundled Local Loops

Due to the above considerations, a number of types of Unbundled Local Loops have been developed in order to simplify the ordering and provisioning process. The different types of loops can be placed into the following categories:

- D Basic Unbundled Loop
- D Analog Unbundled Loop with Specified Signaling
- D Digital Unbundled Loop

The most prevalent means of voiceband exchange access involves a loop-start interface, with the exchange carrier providing the battery feed. Because this arrangement is widely used, Unbundled Local Loops supporting such signaling have been assigned a unique category, denoted the Basic Unbundled Loop.

An Unbundled Analog Loop with Specified Signaling is intended to interconnect locations via `private-lines.' This arrangement provides a voiceband transmission channel with various signaling options.

The Digital Unbundled Loop provides a channel that can support one of a described set of digital transmission schemes.

3.5 Interfaces

Unbundled Local Loops are available with two-wire and four-wire interfaces, depending on the particular type. The same number of wires will be provided at both the MDF and the End User Interface. For two-wire interfaces, one conductor is denoted Tip and the other is denoted Ring. For four-wire interfaces, the conductors of one pair are denoted Tip and Ring, the conductors of the other pair are denoted Tip 1 and Ring 1.

The interface at the MDF is not accessible by the CLEC. Instead, it is connected to other BST unbundled elements, or it is connected - via tie cabling - to collocated CLEC equipment. The tie cabling is not part of the unbundled loop.

3.6 CLEC Equipment Requirements

In addition to applicable FCC, NEC, and UL requirements and orders, CLEC equipment shall also meet the following requirements:

- D The dc voltage applied to either conductor shall be negative with respect to ground
- D The open-circuit dc voltage applied to any conductor shall be less than 80 Vdc when measured to ground or any other conductor.
- D The power delivered to a load via BST facilities shall not exceed 2.5 watts.
- D The current provided, via BST facilities, shall not exceed 150 mA.

3.7